SOIL conservation

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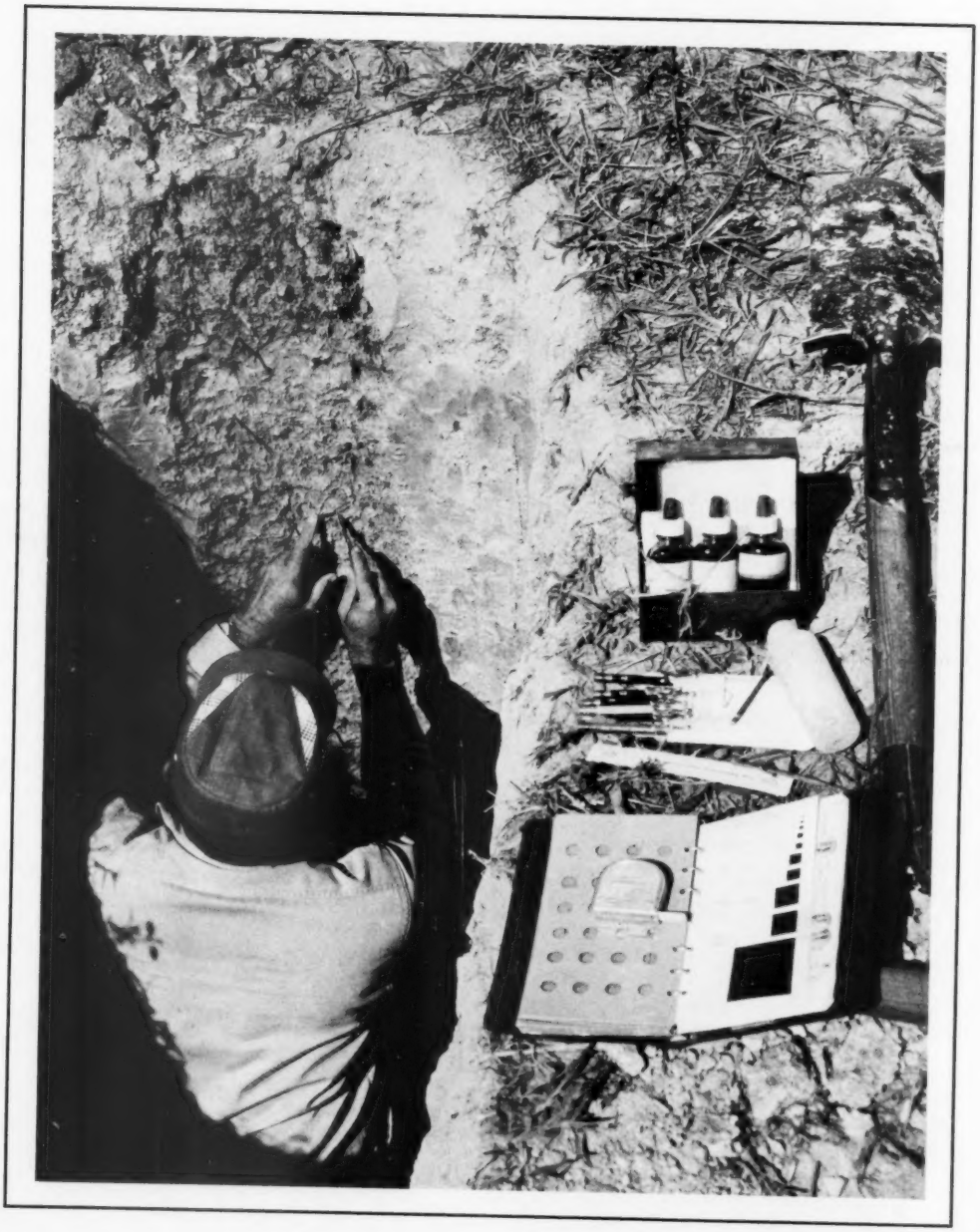

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Soil surveys and soil scientists are saluted this month in SOIL CONSERVATION. There is almost a desperate need to determine the best purposes to which land should be dedicated. The soil survey offers the opportunity to answer that need.

Computers may be the best way for soil scientists to keep up with the demand for soil data. Lindo Bartelli discusses what is being done in that field. A three-author article explains why Nevada needs and plans to use reconnaissance soil surveys. What's good for Nevada may be good for other parts of the country.

George McGrath has put together a neat article about the "debut" of the soil survey of Greenbrier County, West Virginia. A true success story—and all it took was a lot of work on the part of some dedicated West Virginians.

COVER: A soil scientist at work.

Prepared in the Division of Information, Soil Conservation Service, U.S. Department of Agriculture, Washington, D.C. 20250.

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From the Administrator:

While the iron is hot

There always has been a pair of eyes watching from the edge of the field as an SCS soil scientist studies the makeup and condition of the land.

An inquisitive deer . . . an uncontented bull . . . the neighbor's dog . . . a curious child . . . or a landowner anxious to use soil information in planning the use and treatment of his land.

Increasingly, the stare at the edge of the field belongs to a town, county, or state planning official. The demand for soil facts and interpretations has grown apace with America's interest in making land use patterns more pleasing for people and protective of their environment.

Communities every day are making decisions in which soil survey information should be considered along with other inputs. Too often they cannot wait until the field study and lab testing and writing and checking and printing are done. Some have had to decide without the soil survey. Others have sought to speed up the soil survey process or to make use of preliminary data . . . almost literally waiting at the edge of the field. In hundreds of counties, local or state governments have paid part of the cost of the survey to speed its completion.

SCS and the other agencies in the National Cooperative Soil Survey have been working to speed the process too, all the way from data gathering to final publication. We've streamlined the manuscript review so well that last year SCS sent 80 surveys to the printer, the most ever in one year and twice the number sent in 1969.

We've worked with local and state governments to provide interim publications that can shorten the waiting game by a year or more. These advance reports—often simply copies of the soil scientists' field sheets and a page or two of interpretive statements—have proved extremely helpful. Training sessions on their use have assured fullest use of the information.

We've also looked for improved techniques and procedures to prepare soil surveys faster, more accurately, and less expensively. For example, contracting out some phases of map compilation and finishing might give soil scientists more time for field surveys.

The use of infrared and color photography from aircraft and from the Earth Resources Technology Satellite now in orbit may provide some data useful in marking soil boundaries, in spotting land use patterns and changes, and in noting vegetative conditions. SCS is cooperating with researchers in other agencies and at state universities to test the usefulness of these programs in several SCS activities.

SCS has developed a standardized form for recording soil data and interpretations in a way that the information can be stored in a computer data bank. This makes possible computer-produced technical guides; soil interpretive tables; and summaries of soil statistics for states, regions, and the nation. Combined with an automated cartographic system, this new procedure will lead to rapid preparation of soil survey and soil interpretive maps for publication.

While working to produce better soil survey information faster, SCS employees and conservation district supervisors must increase their efforts to work with people who can use soil information and to help them understand its value.

Finally, SCS recognizes that the kinds of soil we have been studying, mapping, and interpreting are ecosystems. We must find more and better ways to help guide thinking in this vastly complex area and to help people develop programs that can preserve and enhance the quality of the environment, the natural resource base, and family standards of living.

The time is now.

Kenneth E. Grant

Courting the computer

Automation in the soil survey program

by Lindo J. Bartelli
Principal soil correlator
South Regional Technical Service Center, SCS
Fort Worth, Texas

The computer is the speediest and most efficient worker that man has ever been able to hire to do a wide variety of jobs—especially those of great magnitude and complexity. Is it just what is needed in the soil survey program?

The use of automatic data processing as an aid in speeding up the preparation of soil survey manuscripts is being tested at the South Regional Technical Service Center, Fort Worth, Texas. Present indications are that computer procedures will ease the task of the soil scientist, who must consider, sort, and record many facts about the area he has surveyed. A computer presumably will allow him to complete a manuscript in a much shorter time and will greatly reduce the amount of clerical work now required to type the text, tables, and captions.

The pilot study involves techniques for preparing soil survey manuscripts in a new way. The Soil Correlation Unit houses two IBM 2741 Communications Terminals which have the capacity to transmit soil survey data by wire to a large IBM 360, model 50, computer at the University of Texas, Dallas.

Edited basic text and soil interpretation data are typed on the IBM 2741 machines, which transmit the material to the IBM 360 computer for storage on an attached memory disc. The information can be recalled by printing through either the Fort Worth facilities or those at Dallas.

This new system introduces the technique of modular writing. Models of selected chapters of soil survey manuscripts, written by a staff member and reviewed and edited, are stored in the computer. Copies of these models are recalled and given to a soil survey party chief when he is ready to prepare a manuscript. He changes the models so that they give complete and accurate de-

scriptive and interpretive data for his survey area. The operator in the Soil Correlation Unit enters the changes indicated by the author, and these become a part of the final manuscript.

The machines are capable also of producing tables that list soil interpretations for the various mapping units in the manuscript.

After all inputs are made, the Dallas computer provides a copy of the manuscript on its high-speed printer. This manuscript is sent to Washington, D. C., for final review and editing prior to publication.

In the statistical laboratory at Iowa State University, in Ames, procedures are being developed for storing interpretation data for soil series from throughout the nation. Plans are being made to develop retrieval procedures for producing not only interpretation sheets for individual series, including important phases, but also numerous other outputs such as tables for soil surveys, technical guides, and special reports.

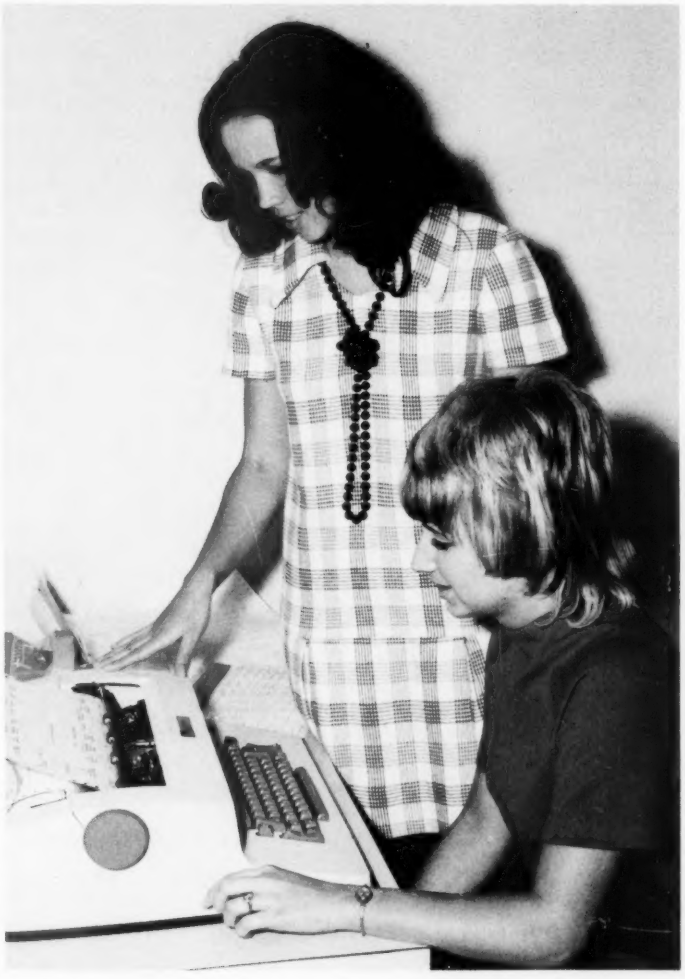
The procedures at Ames also will provide for various analysis of interpretive and inventory data and the printing of resultant summaries as needed to depict the nation's land use potential.

Plans are also underway to automate map compilation. An advanced mapping system is being designed to produce press negatives of soil survey atlas sheets, ready for the printer.

A byproduct of this map compilation procedure is the ability to produce data in map or tabular form. The system as presently planned is expected to produce base maps and soil interpretation maps for resource planning and development.

The SCS Cartographic Unit in Hyattsville, Maryland, has digitizing and automatic drafting equipment that is being used for both map production and developmental work. The Advanced Mapping System will consist of digital scanners, coordinate digitizers, high-speed printer/plotters, an interactive graphic display system for editing, and a small computer to act as a central controller that could be connected on-line to a large-scale computer, all in conjunction with our present equipment.

The present computer system with one terminal at the Fort Worth RTSC can produce about 35 soil survey manuscripts, and several special reports, per year. It is estimated that this system may reduce the man-hours required for field preparation of manuscripts by as much as 50 percent. ♦



Connie Miller (standing) and Vicki High of the Soil Correlation Unit in Fort Worth use an IBM 2741 Communications Terminal to transmit soil survey data to an IBM 360, model 50, computer at the University of Texas in Dallas.

Presenting...
The soil survey

by George E. McGrath, Jr.
Information Division, SCS
Washington, D.C.

Last summer in southeastern West Virginia, the Greenbrier County Soil Survey was released to the public.

Greenbrier County is the second largest county in the Mountain State. It covers 656,640 acres. It took many years to survey the county's soils and map each acre—but it was worth it.

Soil conservation district officials, SCS people in the state, some planners, and a few others knew the value of the finished soil survey. But how do you prepare the public—including landowners and developers—to accept it? How do you get people to realize that they have one of the most useful tools they could possibly use?

In Greenbrier County, a committee was formed well in advance of the public unveiling of the soils report scheduled for July 31. The committee developed and carried out a "plan of action" to explain the need for the report and the many uses to which it could be put. The committee's chairman was Albert E. Beaty, SCS district conservationist at Lewisburg. Committee members were David E. McKinney, SCS soil scientist; James M. Van Metre, county extension agent; and David E. Tuckwiller, supervisor of the Greenbrier Valley Soil Conservation District.

Al Beaty and Jim Thorn, the SCS information specialist at Morgantown, decided that a series of articles on the soil survey in local newspapers could result in widespread publicity. They approached the editor of the *West Virginia Daily News* at Lewisburg about the project, and he agreed to give first-page coverage to the soil survey for 13 consecutive weekdays ending on July 31.

The daily articles dealt with a variety of topics: why engineers and developers need a modern soil survey; step-by-step explanation of how soils are mapped; se-

Leonard S. Newman studies the texture of the soil . . . and Woodrow W. Beverage checks soil acidity . . .

lecting the right soil for the right use—timber production, agriculture, recreation, wildlife; and the wide variety of soils and of land uses in Greenbrier County.

James S. Bennett, the SCS state conservationist, led off with an article describing a soil survey as an "X-ray of the soil." He stated, "Properly interpreted, this (soil survey) information enables us to 'get ahead of the bulldozer.' "

Another article explained that in West Virginia soil surveys are carried out cooperatively by SCS and the West Virginia University Agricultural Experiment Station and that the educational program is a joint responsibility of SCS and the West Virginia University Appalachian Center.

The writers of the articles, in addition to Bennett, McKinney, Van Metre, and Thorn, were Gus R. Douglass, West Virginia agriculture commissioner; James L. Dove, conservation engineer; Richard H. Andersen, assistant state soil scientist; John Gorman, woodland conservationist; Barker W. Hopkins, area conservationist; Norris R. Caryl, assistant state conservationist for watersheds; Keith O. Schmude, state soil scientist; Dr. Mannon E. Gallegly, director of the Division of Plant Sciences, West Virginia University; Dr. William Van Eck, West Virginia University Extension Service.

The *West Virginia Daily News*, with a circulation of 5,100, did much to get the word to the county's 32,000 residents. People began to talk about the soil survey; they kept on talking and asking questions about it as the July 31 meeting approached. With each article, more interest developed, and local conservationists knew they had something big. Requests for the soil survey were coming in from throughout the county and the state and from as far away as Hawaii. Of course, many requests came from potential investors in the county.

Other public media in West Virginia also helped the survey to make the scene. Al Beaty went on television and radio with Dave McKinney. Radio spot announcements about soil surveys, prepared by the SCS Information Division in Washington, D.C., were used everyday from July 15 to July 31 by WRON, in Ronceverte, and WSLW, in White Sulphur Springs.

A special slide talk about interpretations of Greenbrier County soils was prepared for the public meeting. In addition, five photo displays were made using the standard SCS cardboard display units—one on the soil survey in general and one each on agriculture, woodland, residential development, and recreation. The slide talk and exhibits were used later to help carry out the followup information program on the soil survey report.

The Greenbrier soil survey was formally released to the public on the night of July 31 at Greenbrier East High School in Fairlea. About 135 people attended that public meeting, but many more already knew what the survey could do for them and their communities, mainly because of the 13 news stories.

Now, that's the way to send a soil survey out into the world! ♦

in gathering soil data to prevent situations like this. This house was built on soils that tend to slip and slide.

Living high in Appalachia

By Robert A. Speich
Coordinator
Mountain-Dominion RC&D Project
Princeton, West Virginia

and John P. Carr
District conservationist, SCS
Hinton, West Virginia

Three mighty mountain rivers become one in Summers County, West Virginia. Where the Bluestone, the Greenbrier, and the New Rivers converge, the terrain rises abruptly as though to mark the meeting place.

The steep, rugged mountains are at once magnificent and forbidding. Not too far away, however, halfway up White Oak Mountain, a rolling plateau presents itself as a far-less forbidding site in an equally attractive setting.

Two unincorporated communities, Jumping Branch and Nimitz, have grown up on this plateau, but not without natural resource problems.

Several areas, including some homesites, were subject to flooding. A shrinking water table and increasing population threatened the quantity and quality of domestic water supplies. Despite abundant level land on the plateau, new construction was nearly at a standstill.

Today the two communities are facing a brighter future, thanks to the coordinated efforts of the residents and the Mountain-Dominion Resource Conservation and Development Project. An RC&D project measure is helping Jumping Branch and Nimitz to solve the contradiction of sometimes having too much water and more frequently having too little.

J. W. McCallister, then of Nimitz and now a railway official in Richmond, Virginia, laid the problems before the Mountain-Dominion RC&D steering committee in 1967. Soon after that a survey team from the Kanawha River Basin Party determined that a dam on Jumping Branch Creek might solve some of the problems by preventing floods and storing municipal water.

At the RC&D steering committee's request, Wallace Cummins, an SCS soil scientist from Louisa, Virginia, studied the soils in the plateau. His 2,000-acre survey included interpretations for housing, sewage disposal, recreation, and other potential developments.

That was the initial RC&D input. Meanwhile, McCallister and a few other believers knocked on doors to awaken an interest put to sleep by years of no hope for change. The local people responded by forming the Jumping Branch-Nimitz Public Service District.

An engineering firm provided cost estimates for the local share of impoundment and water supply system costs. The Soil Conservation Service agreed to plan and finance flood-control construction. The Farmers Home Administration agreed to furnish a grant and loan to finance the water system. And West Virginia's Bluestone State Park came in as a water customer, adding the equivalent of 47 families to the 125 already signed up.

Construction of the dam started in 1970 and was finished in the summer of 1971. A $51,000 RC&D loan, a first in the Mountain-Dominion project area, financed the local share of the impoundment. The water distribution system, with FHA aid, was completed early in 1972. Today, more than 200 households and businesses are using the water.

Success with water resources has generated other community actions in Jumping Branch and Nimitz. Groundwork is underway for a community plan that will use the soil survey as a guide. New projects, such as sewage disposal, parks, fire protection, and obtaining natural gas, are being talked about by the newly formed Jumping Branch-Nimitz Improvement Association.

About 10 new houses have been completed and are occupied. Developers have cleared land for two new subdivisions that will use water from the Jumping Branch lake.

"We've got a great future up here," said Steve Bennett, current chairman of the Public Service District board. "We're proud of our mountains, fresh air, and open spaces. With all the emphasis on the environment and land use planning these days, we plan to utilize agencies like SCS and FHA that are willing to help us become the finest community in West Virginia." ♦

This dam has helped solve for two communities in Summers County, West Virginia, the contradiction of sometimes having too much water and more frequently having too little.

The ground's the limit

by Morris S. Gillespie
Public information officer, SCS
Auburn, Alabama

The ground's the limit for an idea that started at Tuskegee, went on to Washington, proceeded to NASA, and wound up with SCS.

The idea was a new planned community to be located near north Birmingham, Alabama. Population-to-be: 42,000. The new town is not the first planned community in the Birmingham area, but it may be the most thoroughly planned community in the South.

The idea originated at the Tuskegee Alumni Housing Foundation. Marcus Dasher, vice president of the foundation, is technical director of the project. The location for the new town is ideal for suburban development because Birmingham industries and commercial areas are already nearby.

The Tuskegee foundation applied for site planning assistance from the U.S. Department of Housing and Urban Development. When the application was approved, the foundation looked for a source of technical assistance. On the advice of Alabama Senator John J. Sparkman, the foundation turned to NASA's Marshall Space Flight Center. NASA has assembled a vast array of scientific disciplines, which it agreed to use to assist in planning the new community.

The Marshall Space Flight Center took both infrared and black-and-white aerial photographs of the area and, using a stereoscope, studied the topography to determine drainage patterns and to locate outcrop areas. NASA studied the character of the subsurface rock by use of seismic devices. To determine soil conditions, NASA turned to the Soil Conservation Service.

Birmingham is the base of operations for a two-man SCS soil surveying team, D. E. "Ed" Lewis and Cleo Stubbs. Both are soil scientists. Lewis, the soil survey leader, gave this project top priority and unpacked his trusty hand auger. He and Stubbs spent 30 man-days on the 6,000-acre project site.

The soil map that resulted is similar to that which would be prepared for a 6,000-acre farm. "In fact," reported Lewis, "it will probably become a part of our standard soil survey report for this area."

The soil interpretations are what set this map and report apart. "We compiled soil interpretations for urban uses," said Lewis, "instead of information that a farmer could use in determining which crops would be suitable for his land."

The report contains a description of the kinds of soil at the site and gives the soil limitations, such as shallowness to rock, susceptibility to flooding, slow permeability, rockiness, and steep slopes. These limitations can restrict urban development at any site.

Knowing soil depth and slope can help planners locate the best areas for dwellings and can be useful in planning the layout of underground cables, sewage lines, gas lines, water lines, and streets.

In most places, there are specific land uses that are limited by the soil. The site for this new town is no exception. Lewis pointed out that some of the soils have limitations for septic tank filter fields, sewage lagoons,

In preparing a soil survey, SCS soil scientists spend many hours at the stereoscope as well as in the field. Soil scientists Cleo Stubbs and Ed Lewis (at the stereoscope) mapped the 6,000-acre site of a new town near Birmingham.
(Below) SCS district conservationist in Birmingham, W. J. King, presents the soil data report for the new townsite to John Bensko, a geologist at NASA's Marshall Space Flight Center in Huntsville and the director of the NASA-assisted planning survey for the townsite. Looking on are James L. Daniels, a NASA environmental applications officer, and Cleo Stubbs.

sanitary landfills, and roads and streets. Some soils would corrode uncoated steel, and others would be unable to support foundations for buildings.

"These soils have a tendency to slip and slide," said Lewis. "Development should probably be restricted to the level and nearly level land and ridgetops, leaving the steep hillsides in trees."

Planners of the new town had more than soil limitations to consider. There are several faults in the area, three abandoned deep mines, several shallow outcrop mines, and some old strip mines. All of these areas have been charted to avoid problems in the future.

Practically everywhere, there are soils that have limitations for urban development. The difference here is that the limitations were recognized before development started; the restrictions imposed by soil, water, and geology were used as a basis for development. The new Birmingham suburb will be one more of a new breed of consciously developed communities. This trend toward conscious development may soon become the norm.

"Land use planning that is based on the limitations of the soil is the answer to some of the problems that plague many communities," said William B. Lingle, SCS state conservationist for Alabama. "And we believe that it takes cooperation among many state and federal agencies in this planning effort to bring about more livable communities."

The ground's a limit, but it's a limit you can build the future on. ♦

Reconnaissance soil surveys aid planning in Nevada

Nevada, like other western states, is experiencing a continuing migration of people and an explosion of physical development unparalleled in history.

Planners and developers are asking for objective resource data for this relatively unexplored part of the nation. There are only vague ideas of the kinds of soils in vast areas, yet a certain minimum amount of information about the kinds and extent of dominant soils is necessary if the land is not to be misused.

Fortunately, with the present SCS soil survey staff in Nevada and the use of modern techniques, a soil survey of the state adequate for broad-area planning can be completed within 10 years.

Environmental setting

Nevada was once considered part of the vast wilderness that separated the civilized seaboards of the nation. Its few residents found a peculiar spaciousness and freedom that lately have attracted an influx of people.

The state is huge—about 71 million acres. About one-third of the state is mountainous, and nearly two-thirds is made up of gently sloping basins. About 5 percent is rolling plateau land.

Only recently have high-speed transportation routes crossed the mountain barriers, nullifying distances and allowing the types of urban-industrial settlement that characterize other parts of the nation. Yet settlement and development still face the old problems of climate and appropriate use of soil-landscapes.

Nevada is arid. This prevailing fact is reflected by a desert shrub vegetation of limited productivity. Aridity restricts cultivated agriculture to several small to moderate-sized irrigated areas.

Besides aridity, cool temperatures and a short growing season limit crop production in the higher basins.

The soils of Nevada are mostly dry for extended periods in summer and fall, but otherwise they vary widely in texture, depth, permeability, salt and carbonate content, organic-matter content, and water-holding capacity. Some have a hardpan at a shallow depth; others are shallow to bedrock. Extensive areas of medium-

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(Top) These broad alluvial fans of the Penoyer Valley are characteristic of vast acreages in the basins of Nevada. The gentle slopes are excellent for agriculture or urban expansion, but in places soil problems could restrict use. Here the soils are fair or not acceptable for irrigation but suitable for urban development. The vegetation is shadscale, budsage, and galleta grass.
(Extreme left) A high water table and the prominent salt efflorescences on the surface of this alkali soil in the Railroad Valley are evidence of soil limitations for most uses. Greasewood and saltgrass are among the few plants able to persist on these soils.
(Left) The distant reaches of this plateau in northwestern Nevada illustrate the physical problem of gathering soil survey data for comprehensive planning.

textured soils on alluvial fans and in basin-fill plains have thick gravel deposits at a shallow depth.

Wet, salty, finer textured soils commonly occur in and around the playa sinks of the numerous internally drained basins. Fine-textured soils with slow permeability occur in the mountains, on the foothills, and on high, old, alluvial fans. Each of these soil peculiarities suggests different suitabilities.

The contrasting patterns of climate and soils are a major factor in expansion and development. Because urban and agricultural development occur in unexpected locations, comprehensive planning to prevent misuse or economic disaster is needed for exceedingly large areas.

The very magnitude of the Nevada landscape is an impediment to rapid collection of detailed soil survey data. But an essential amount of soil survey data can be gathered using less detailed soil survey procedures.

The basins and their surrounding mountainous watersheds range from roughly several thousand to about 2 million acres in size; most are large. Within these basins, soils occur in large repetitive patterns on alluvial fans, basin-fill plains, beach plains of glacial age, and foothills that are miles in extent. Physiography and vegetation are not sufficient criteria for predicting soil occurrence. But when these surface features are considered in combination with pits dug along traverses or on selected landscape positions, they allow prediction of patterns of soils over large areas.

Mountainous terrain is physically more difficult to study, but salient soil properties can be projected over large areas once genetic relations are established. Observation of landscape features cannot be substituted for identification of soil properties in pits; the two procedures must be combined.

Uses and needs for soil survey interpretatons

Detailed soil surveys have been designed to have a high content of information. A great number of different interpretations are possible. Detailed soil surveys can be used to assess soil suitability or limitations for rather small parcels—half an acre to 10 acres —or they can be generalized by grouping similar soils or soil patterns to show single or multiple factor suitabilities for areas of several thousand acres.

Because they are based on identification of observed properties of the soils, rather than on interpretations made at the site, or on mechanical enumeration of selected properties, that is, factorial identification, detailed surveys can be used as a basis for making interpretations about many soil-related problems. Traditionally, detailed soil surveys have been used for operational planning and management of small parcels of land.

Nevada today is faced with burgeoning planning needs and efforts but has few resources to collect soil survey data. Essentially all of the state is subject to development, but its population of about half a million is concentrated in the Las Vegas and Reno-Carson City areas. Only 13 percent of the state is privately owned; the rest is federal land administered by several government agencies. Presently, areas needing soil survey data for planning include about 100,000 acres each in Reno and Las Vegas, 204,000 acres in the Tahoe regional planning area, 3,140,000 acres in Churchill County, and the 70 million acres of a state water plan.

At present, about 7 million acres have been mapped in detail, another 7 million acres have been mapped for reconnaissance soil surveys, and 57 million acres remain unmapped. Of the unmapped acres, about 4 million are foreseeably subject to urban expansion or conversion to intensive agriculture, thus warranting detailed mapping. In the remaining 53 million acres, enough soil survey data must be collected to meet the needs of land use planners and to provide guidance in the selection of areas that have potential for intensive use. Fortunately, the scale at which this kind of planning is made allows the use of less detailed soil survey data. A reconnaissance soil survey will identify the more important properties of the dominant soils and their approximate location and extent.

Reconnaissance soil surveys in Nevada

Reconnaissance soil surveys display and record geographic patterns of soils, their morphological properties, and interpretations with great enough specificity of location to allow planners to block out areas of peculiar suitability or problems. The surveys show where major kinds of soil are located and their extent, the shape of large areas, and the distance and different terrain separating these areas. They suggest engineering and agronomic techniques needed for land use development.

The level of precision of these data is commensurate with that of comprehensive plans. Planners intend to flag areas within which ordinances or criteria for land use will be applied to achieve goals and objectives. They look to the larger economic and environmental impacts of development rather than to site-by-site judgments.

Soil surveys have proved to be useful political devices for planners. They provide technical support for decision making and

present soil resource data in geographic patterns that can be understood by the people. But to be useful, soil survey data must be available *early* in the planning process.

The most experienced soil scientists can map from 8,000 to 15,000 acres per man-day using reconnaissance soil survey procedures, or about 1 million acres per man-year. In comparison, detailed surveys progress at about 160 to 200 acres per man-day, or 50,000 to 70,000 acres per man-year. The economics for making reconnaissance soil surveys in Nevada are clear.

The nature of reconnaissance soil surveys

Reconnaissance soil surveys differ from the more familiar detailed surveys in the *generality* of their mapping units and the identification of the soils within them. They also differ by their intensity of field study; fewer soils are described in pits, and patterns of soils are projected over larger landscape elements without drawing boundaries of individual soils within delineations on the maps.

Reconnaissance soil surveys, like detailed surveys, consist of (1) a soil map based on field study and (2) a report of soil properties, environmental features, and interpretations.

Generality in soil mapping has a somewhat unexpected value in comprehensive planning. Generality is achieved by ignoring small bodies of odd but striking soils and by combining noncontrasting inextensive soils with the dominant soils.

The Nevada reconnaissance soil survey

In 1969, the Nevada Cooperative Soil Survey initiated a reconnaissance soil survey of the entire state with active support from the Division of Water Resources, Nevada Department of Conservation and Natural Resources. Objectives of the survey included soil survey data inputs to a 4-year state water plan. The plan requires rather specific soil suitability evaluations for agricultural or urban expansion in several large basins, in addition to a general, statewide assessment of soils suitable for irrigation.

Because water is such a critical resource in Nevada, 49 reconnaissance soil survey areas were delineated to accord with the boundaries of groups of hydrographic areas used for water planning rather than with the county boundaries that were drawn during the early mining days in little conformity to physiography. These survey areas range from 369,280 to 2,305,920 acres; most are about 1,500,000 acres.

Field mapping is done on aerial photos at a scale of 1 inch equals 1 mile, and the soil maps are published at about one-quarter of this scale using topographic base maps prepared by the U.S. Geological Survey. The reports include a discussion of major environmental features, characteristic soil features of the area, a general soil map at a scale of about 12 miles to 1 inch, and tabular description of soil properties and soil interpretations.

One reconnaissance soil survey has been published, one is in press, and three are in preparation. ♦

When this photograph was taken in 1962, suburbs had already spread out from Reno, up onto the high, old alluvial fans that surround the lower valley. The soils on these fans exhibit marked shrinking and swelling and have caused breakage of pavements and foundations; they are unsuited for septic tank filter fields. Reconnaissance soil surveys flag such areas for planners. The open space shown here is now taken up by housing.

Buena Vista is looking better

by A. Bertram Hawkins
District conservationist, SCS
Lexington, Virginia

The people of Buena Vista, Virginia, are converting an old dairy farm in a picturesque setting in the Blue Ridge country into a 266-acre park.

Glen Maury Park is a project of the Virginia Outdoors Plan. It is funded 50 percent by the U.S. Department of the Interior's Bureau of Outdoor Recreation, 25 percent by Virginia's Commission of Outdoor Recreation (COR), and 25 percent by the city of Buena Vista.

The idea was conceived by B. C. (Bud) Nelson, Jr., shortly after he took over the duties of city manager in 1970. The city had just recently purchased the farm but had no definite plans for it. Nelson sold his idea to the City Council and engaged an engineering consultant to draw up some preliminary plans. With the plans tucked under his arm, he took off to Richmond to get COR approval.

Establishing the park on the site of the former family dairy operation will bring about a shift in land use that better suits the soils of the entire tract.

The project, estimated to cost $800,000, will be carried out in three phases.

The first phase, for which $300,000 is already available, includes the construction of picnic areas, an overnight campground, hiking trails, a horse show ring, a playground, roads, parking areas, and water and sanitary facilities.

Phase two includes tennis courts, a football field, baseball diamonds, an outdoor theater, and a swimming pool. A golf course, ski slopes, and a sled run will come with phase three.

The plans also include an outdoor classroom and nature study areas along the hiking trails.

The picnic areas and campground, with water and sewer lines and sanitary facilities, were in use by Labor Day of 1972.

The campground has 75 sites with water and electric hookups, picnic tables, and grills; two comfort stations with hot and cold showers; and laundry facilities.

Early in the planning stage City Manager Nelson asked the Natural Bridge Soil and Water Conservation District for information about the soils on the farm. The previous owner had been a cooperator with the district, so the Soil Conservation Service had already surveyed the soils. SCS had only to interpret the soil data for new uses.

The Natural Bridge District gave technical help in the layout for roads, trails, and campground and in land shaping and grading and recommended cover treatment for the various uses. It will help also in the development of the outdoor classroom.

The project has provided summer employment for young people of the community through the Neighborhood Youth Corps. In the past two summers, 80 youths have been employed to help prepare Glen Maury Park for the Labor Day opening.

"Last Labor Day, close to 15,000 people came to Glen Maury Park," said Shuler A. Kizer, mayor of Buena Vista. "The park is possibly our greatest asset. It is unique in that it has potential for providing year-round recreation. ♦

These poles, standing like sentries over the city, will hold up a two-story open air pavilion for band concerts.

Terraces in town

They call our soil sugar clay. There have been lawsuits in Council Bluffs brought on by this hard-to-handle loess soil—in one case, a house had nearly split in two when the fill material settled.

When the First Southwest Iowa Service Corporation decided to build Horizon Hills, an 18-acre development, right along the top of a bluff—above a residential area—acute runoff and sediment problems were visualized.

The corporation is hoping to solve such problems with 1,200 feet of tile intake terraces. Five terraces have been installed to let water down safely to a storm sewer about 50 feet below the development. One street has been designed to serve as a terrace.

Leland Lykke, president of the corporation, said the decision to terrace was a joint one between himself, contractor Larry Tweedt, and consulting engineer Ken Milford of H. G. McKeown and Associates.

Tweedt is president of the Council Bluffs Homebuilders Association. After a meeting of the association last spring, he knew he could count on the Soil Conservation Service for seeding recommendations and other help. At that meeting the SCS district conservationist gave a slide talk on land use and passed out an urban land use guide, which was developed by the West Pottawattamie Soil Conservation District and approved by the Council Bluffs City Council. The guide includes an urban land use code and discusses topics such as drainage, site preparation, grass cover, mulching, and rock retaining walls.

The author is shown inspecting tile intake terraces at an 18-acre development with Leland Lykke, president of the corporation building the development.

Milford, the consulting engineer, knew where to place the terraces to fit the 51 lots of the Horizon Hills development. He asked SCS for design criteria for the fills for water and silt storage and for determining the size of tile needed to handle a 4-inch rain in 4 hours. Easements were reserved for temporary water backup at the inlets.

Tweedt admitted that the terraces definitely increase development costs. "But they're necessary—I've seen what one big rain can do to a developing area," he said.

He and Lykke have had people in the residential area below Horizon Hills ask about runoff from the development. It feels very good, they agree, to be able to tell those people that potential runoff and sediment problems were planned for in advance—and prevented. ♦

by Cal Cox
District conservationist, SCS
Council Bluffs, Iowa

Dream house becomes haunted house

by Donald L. Lucas
Soil scientist, SCS
Yreka, California

"I'm sure my house is haunted," said Mrs. William Miller to SCS soil scientist, Jesse Newlun.

"When we moved in, the house was perfect. Then strange things began to happen. Right now, my furniture will not stay level, and cabinet doors pop open all of a sudden. We hear strange noises throughout the day and night."

In June 1970, Mr. and Mrs. Miller moved into their new house in Siskiyou County in northern California.

About a year later, disaster struck. Structural damage to the house had occurred and was getting worse. A room divider had separated from the ceiling; it could easily be moved back and forth by hand. And the bathtub had separated from the wall by half an inch. The living room floor in places was almost an inch lower than it had been.

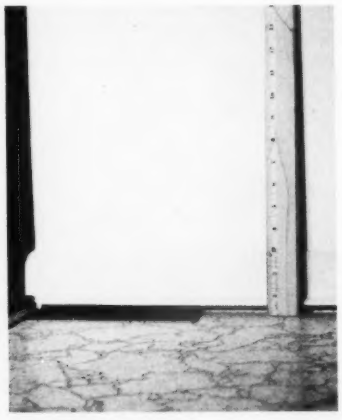
What was happening? The contractor who built the house could not explain the failures. The house had been built to local code. The usual inspections had been made during construction.

The Farmers Home Administration had financed the house and was a bit concerned about its investment and about house owners in that area.

FHA asked the Soil Conservation Service for help in solving this peculiar problem.

A soil scientist and an engineer from the local SCS office studied the soil map of the area in detail.

The "ghost," it turned out, was the soil—something that nearly everyone takes for granted. Nobody had thought to investigate to be sure the soil was suitable for dwellings.



The floor in this house dropped half an inch to an inch in places because the house was built on a clayey soil.

In this particular area, the soil is a type of clay that expands when wet and contracts on drying. The soil moves and cracks severely when it dries; cracks up to 3 inches wide and 4 or 5 feet deep appear. The soil rises and falls several inches in the course of wetting and drying and does so unevenly. This causes areas to develop high and low spots.

To make matters worse, the soil under the Millers' house tends to be dry, but the soil at the edge of the house is either wet or dry depending on the season or the amount of water on the ground.

Damage to the Millers' house could have been prevented. If the soil had been studied and its characteristics identified, a proper foundation could have been designed and built. The house would have cost the Millers a bit more, but wouldn't it have been worth it? No one wants to live in a "haunted" house. ♦

conservation in action

Review, review, review

Land use review is a familiar phrase to SCS people in New City, New York, and to supervisors of the Westchester and Rockland Soil and Water Conservation Districts in the rapidly developing area north of New York City.

Understandably, proper land development is a major concern in the area. "Careless developers can cause many problems," said Bob Jonas, SCS district conservationist. "All too frequently they are not concerned about the stability of steep slopes. In some developments, they do not provide surface drainage. They have put houses on flood plains or in areas where there will be wet basements. And in many places they do nothing or very little about erosion and sedimentation during construction."

"To avoid such situations, we must get soil information to planners in the early stages," said Peter Eschweiler, commissioner of Planning for Westchester County and secretary of the Westchester County Soil and Water Conservation District. But until recently the county didn't have a modern soil survey. To obtain the information, Bob Jonas or one of his assistants would have had to make an on-site investigation of the soils for each development in the county.

Recently, under the sponsorship of the Westchester County government, a soil survey of the county was completed. The county's contribution of $75,000 accelerated the survey operations.

"For the Westchester County Community College, the locations for three new buildings, including parking lots, were picked on the basis of soil suitability," said Eschweiler. "And because we had soil data available, we were able to pick a suitable site for new student and staff housing at a county medical college. Some drainage proposals for this project were rejected on the basis of the soils."

Gratifying though these results were, the reviewing of subdivisions in such a large area was still a major job. To relieve some of the pressure on the SCS staff, the Rockland County Soil and Water Conservation District worked out a financial arrangement to bring in an additional resource conservationist, George Lee, to work specifically on development problems in that county.

Within 5 months a busy Lee had completed almost 200 land use reviews. These covered 842 dwelling unit sites and 28 commercial unit sites on 960 acres of land.

As a result of recommendations made in the conservation district's technical reports, many plan revisions were required by Rockland County town planning boards. The revisions include surface drainage improvements, better grading plans, better protection against flooding, and improved control of sediment, erosion, and runoff onto streets and adjoining properties.

Much of Lee's work has been in Clarkstown. "SCS has been of material assistance to the town," stated Charles Cassels, secretary of the Clarkstown Planning Board. "The SCS staff does a thorough job of review. As a result, some truly dangerous situations have come to light. These could not have been discovered through the town's efforts alone."

Putting a rough estimate on benefits of the program to Clarkstown, Cassels said, "Several million dollars will be saved by the work of SCS and our conservation district. And the saving of a million dollars in flood prevention is really a saving to the private citizen, because he won't have to pay for flood damages through his taxes."

To Cassels, land use reviews are part of an increasingly more streamlined and beneficial planning process. "All planning is 10 years too late," he said. "But as conservation districts and agencies like SCS have a greater influence on town planning, the time span becomes less and less between creation of a land use problem, recognition of the problem, and solution of the problem. Finally, the three occur nearly at the same time."—VINCENT J. PRICE, *Information Division, SCS, Washington, D.C.* ♦

Local money accelerates soil surveys in North Carolina

Seven of the nine soil surveys now underway in North Carolina

are being accelerated by substantial amounts of money appropriated by county governments.

The soil survey of Cumberland and Hoke Counties, which include Fort Bragg Military Reservation, is being expedited by money from the two counties and the Department of the Army. The Mecklenburg County survey, which will get started next March, will also get a boost from local funds.

The local money supplements soil survey money provided by the Soil Conservation Service and North Carolina State University.

Most of the money has come from areas where the need for soil information is rapidly increasing. If soil scientists and other personnel are available, a soil survey of such areas can be started several years ahead of schedule.—BOBBY T. BIRDWELL, *assistant state soil scientist, SCS, Raleigh, North Carolina.* ♦

Organic trees

An 82-year-old eastern Kentuckian is managing a large acreage of hilly woodland with little more than an ax.

As a devoted naturalist, Edward Holbrook of Morgan County likes to hike through his steep wooded hills to look at the trees or watch the wildlife and insists on silviculture without modern conveniences. He says he gets his best tips on woodland management from the Soil Conservation Service, but he wants no short cuts, thank you.

Holbrook has done without treating his land or trees with chemicals.

When Holbrook retired in 1954 after teaching school and serving as a field agent for the Federal Land Bank, the great potential of his large forest beckoned him. At the age of 65, with an ax over his shoulder and his dog leading the way, he cut vines, culled trees, and built several miles of trails and fire lanes. But he left intact long sections of crooked split-rail fences that his father put up in 1908.

"My efforts," says Holbrook, "are to get rid of strangling vines and to kill off undesirable trees that crowd out desirable ones. But small undergrowth and good forest-floor litter are needed to absorb water, enrich the soil, and stop erosion."

Edward Holbrook, octogenarian, rests near three chestnut stumps from which the split-rail fence in the background was built by his father about 1908.

Holbrook's achievements have been steady and strong. By 1958, he had improved 400 acres of woodland and planted more than 30 acres in trees. Today, he has completed 720 acres of woodland improvement and has planted nearly 200 acres of white pine and black walnut seedlings.

His future goals include planting black walnut trees in a bottom-land field in combination with other vegetation that will provide food and cover for deer, squirrels, birds, and rabbits. Also with wildlife in mind, Holbrook abstains from felling nut-bearing and den trees.

Now Holbrook is ready to sell his prime timber. He has some of the finest, tallest, straightest poplar, maple, oak, hickory, and beech to be found anywhere.

The naturalist is a true conservationist. "I manage my woods well," he says. "I won't allow trees to decay and be wasted."—BERLYN BROWN, *district conservationist, SCS, Burkesville, Kentucky, and* CHARLES FOSTER, *staff forester, SCS, Lexington, Kentucky.* ♦

Review

Books

Compaction of Agricultural Soils. 1971. *American Society of Agricultural Engineers (2950 Niles Road, St. Joseph, Mich. 49085). 471 pp., illus. $35.*

If there is anything about soil compaction you always wanted to know but didn't know where to find it, this monograph is for you—even though it does not deal with deliberate compaction for construction.

Written by 23 engineers and soil scientists, this book gives a comprehensive, up-to-date review of the status of knowledge not only about soil compaction but also about almost everything that is affected by compaction or related to it. Approximately 800 references are cited.

What compaction is, how it is measured, and how it is induced—not only by farm equipment and livestock but also by natural phenomena—are treated in some detail. The authors explain how and to what extent compaction affects content and transmission of moisture, air, and heat; how it affects the soil nutrient status; and how it relates to soil strength.

Not neglected are the relationships of soil compaction to plants—to the emergence of plants from seeds, to root development as affected not only by the resistance offered by the soil itself but also by aeration, soil temperature, moisture supply, and nutrient supply as affected by the compaction status, or bulk density, of the soil.

As expected, the effects of tillage on compaction are explained but rather unexpected are the in-depth discussions of shrink-swell and freeze-thaw phenomena and their relationships to soil condition.

Although, in the last chapter, it gives some practical advice about how to minimize compaction, this monograph is not a how-to-do-it book. It is a monograph for researchers and others who are interested in what is known about compaction and its complex relationships.—**ARNOLD C. ORVEDAL, *former assistant director, Soil Survey Interpretations Division, SCS, Washington, D.C.***

New publications

Conservation Practices—Signs of Good Hunting and Fishing. By Lawrence V. Compton, Felix Summers, and Philip F. Allan. *1972. USDA Program Aid 1012. 32 pp., illus.* $0.20. This publication supersedes PA-400, "Soil Conservation Tips for Sportsmen." It tells why stripcropping, hedges, windbreaks, field borders, and ponds are "signs" of good wildlife land. Included in the booklet are tips for hunters and fishermen on improving their relations with farmers and ranchers.

Maintaining Subsurface Drains. *1972. USDA Leaflet 557. 8 pp., illus.* This leaflet supersedes Leaflet 347, "Keep Your Tile Drains Working." It discusses common trouble spots and maintenance of inlets, drains, outlets, and ditches; suggests methods for mapping a drainage system.

Environment Restored, Yazoo-Little Tallahatchie Flood Prevention Project, Mississippi. *1971. USDA Forest Service. [16] pp., illus. in color.* To restore the desolated environment in north-central Mississippi, the Soil Conservation Service and the Forest Service working through soil conservation districts assumed on-the-ground direction for the Yazoo-Little Tallahatchie Flood Prevention Project. This report summarizes the accomplishments of the project since its inception in 1944. Millions of trees were planted; timber stands improved and land returned to agricultural production amounted to thousands of acres; and ¾ of a million brush dams were built to stop erosion. Many ponds, water diversions, and drainage ditches were built. Out of the restored land came forest products, crops and cattle, and recreation that benefited the area and increased the economy manyfold.

Public Land Statistics, 1971. *U.S. Dept. of the Interior, Bureau of Land Management. 188 pp., illus. $0.75.* Presents 127 tables on the history, status, and use of public lands in the United States and possessions.

Research Needs for Irrigation Return Flow Quality Control. By Gaylord V. Skogerboe and James P. Law, Jr. *1971. U.S. Environmental Protection Agency, Water Pollution Control Research Series. 98 pp., illus.* $1. This report sets out to define the major geographic areas where irrigation return flow problems exist, to specify the major water quality problems arising from irrigation return flows and how these differ by regions, to propose potential solutions required to alleviate and/or control water quality degradation by irrigation, and to define specific research activities most urgently required to design and implement control measures or potential solutions to critical problems.

Water Rights Laws in the Nineteen Western States. By Wells A. Hutchins. *1971. USDA Misc. Pub. 1206, Vol. 1. 650 pp.* This work presents a comparative analysis of the development and status of the constitutional provisions, statutes, reported court decisions, and some administrative regulations, prac-

tices, and policies regarding water rights laws in the 17 contiguous western states plus Alaska and Hawaii. The analysis includes the nature of such water rights and their acquisition, control, exercise, transfer, protection, and loss. In addition to the relevant state laws, federal, interstate, and international matters are also discussed. An extensive appendix includes summaries of selected components of the water rights systems of each state.

Wastewater Management by Disposal on the Land. S. C. Reed, Coordinator. 1972. *U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory (Hanover, New Hampshire) Special Report 171. 184 pp., illus.* This report provides a technical assessment of land disposal methodologies for use in the Corps of Engineers' Wastewater Management Program. Nine essentially independent chapters assess in detail critical operational parameters and ecosystem components for land disposal concepts. A summary discusses disposal techniques and ecosystem responses.

Three basic techniques of land disposal are considered—spray irrigation, overland runoff, and rapid infiltration—and the conclusion reached is that any one of the three meets quality standards if proper site conditions exist and proper operational criteria are employed. Of the three application modes, spray irrigation offers the highest degree of reliability and potential longevity. Overland runoff, rated second, may require operational manipulation to realize the same useful life as spray irrigation. Rapid infiltration requires the most extensive and thorough site investigation to insure that favorable conditions exist.

Effects of Noise on Wildlife and Other Animals. By Memphis State University. *1971. U.S. Environmental Protection Agency. 74 pp. $0.70.* This report discusses the effects (auditory and nonauditory) of noise on laboratory animals and farm animals (mammals and poultry). It discusses also the demonstrated and suspected effects of noise on wildlife (mammals, birds, fish, and insects). For the purpose of this report "wildlife" is defined as those animals that were not born or hatched in captivity.

The literature search reported here was concentrated on the period from 1950 to the present, but earlier pertinent studies are also reviewed. Relevant and readily obtainable reports from foreign literature are included. A detailed report of libraries, information retrieval services, source materials, and persons and agencies contacted for information is presented in the appendix.

In general, few if any of the reported or suggested effects of noise on animals benefit the animal or increase his chances for survival. Some, in fact, might possibly lead to his death or decrease his chances of survival.

How To Control Wind Erosion. By N. P. Woodruff, Leon Lyles, F. H. Siddoway, and D. W. Fryrear. *1972. USDA Agr. Inf. Bull. 354. 22 pp., illus.* $0.20. Supersedes Farmers' Bulletin 2169, "How To Control Soil Blowing." Wind erosion occurs in the Great Plains; around the Great Lakes in Michigan, Wisconsin, and Ohio; along the eastern seaboard; in the Southeastern Coastal Areas; and in the Northwest, especially in newly irrigated areas. This bulletin discusses ways of controlling wind erosion—such as by stubble mulching, minimum tillage, stripcropping, crop rotation, wind barriers and shelterbelts, and landforming and benching—on dryland cultivated soils, on irrigated lands, on vegetable and specialty croplands, on grazing lands, and on sand dunes and other problem areas.

Agricultural Prices, 1971 Annual Summary. *1972. USDA, Statistical Reporting Service Pr 1-3(72). 174 pp.* Summarizes the latest available monthly, season, and annual prices that farmers receive for their commodities.

1972 Handbook of Agricultural Charts. *USDA Agr. Hbk. 439. 144 pp., illus.* $0.65. Contains 170 charts and 117 tables depicting the domestic situation, foreign production and trade, population and rural development, the family, and commodity trends.

Soil survey

DeKalb County, Tennessee. By William C. Moffitt, James F. Brasfield, Jesse F. Campbell, and Roy K. Moore. *1972. Soil Conservation Service in cooperation with the Tennessee Agricultural Experiment Station. 64 pp., illus.; maps 4 inches to the mile (1:15,840).*

Pickens County, South Carolina. By Huger S. Byrd. *1972. Soil Conservation Service in cooperation with the South Carolina Agricultural Experiment Station. 70 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

Marion County Area, Oregon. By Lynn H. Williams. *1972. Soil Conservation Service in cooperation with the Oregon Agricultural Experiment Station. 132 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii. By Donald E. Foote, Elmer L. Hill, Sakuichi Nakamura, and Floyd Stephens. *1972. Soil Conservation Service in cooperation with the University of Hawaii Agricultural Experiment Station. 232 pp., illus.; maps 0.25 inch to the mile (1:253,440).*

Dawson, Lumpkin, and White Counties, Georgia. By C. L. McIntyre. *1972. Soil Conservation Service and Forest Service in cooperation with the University of Georgia, College of Agriculture, Agricultural Experiment Stations. 106 pp., illus.; maps 4 inches to the mile (1:15,840).*

Northern Santa Barbara Area, California. By Gordon E. Shipman. *1972. Soil Conservation Service in cooperation with University of California Agricultural Experiment Station. 182 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

Van Wert County, Ohio. By A. R. Brock and Lawrence A. Tornes. *1972. Soil Conservation Service in cooperation with the Ohio Department of Natural Resources, Division of Lands and Soil, and the Ohio Agricultural Research and Development Center. 73 pp., illus.; maps 4 inches to the mile (1:15,840).*

Lake County, Indiana. By Ival D. Persinger. *1972. Soil Conservation Service in cooperation with the Purdue University Agricultural Experiment Station. 94 pp., illus.; maps 4 inches to the mile (1:15,840).*

Canyon Area, Idaho. By T. W. Priest, C. W. Case, J. E. Witty, R. K. Preece, Jr., G. A. Monroe, H. W. Biggerstaff, G H. Logan, L. M. Rasmussen, and D. H. Webb. *1972. Soil Conservation Service in cooperation with University of Idaho College of Agriculture and Idaho Agricultural Experiment Station. 118 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

Starr County, Texas. By Charles M. Thompson, Russell R. Sanders, and DeWayne Williams. *1972. Soil Conservation Service in cooperation with the Texas Agricultural Experiment Station. 62 pp., illus.; maps 2.62 inches to the mile (1:24,000).*

Meetings

January 1973
- 7–11 National Association of Home Builders, Houston, Tex.
- 10–11 National Council of Farmer Cooperatives, Orlando, Fla.
- 22–25 National Woolgrowers Association, Washington, D.C.
- 25–27 American National Cattlemen's Association, San Antonio, Tex.
- 26 National Highway Research Board, Washington, D.C.
- 28–Feb. 2 American Society of Civil Engineers, Water Resources Conference, Washington, D.C.
- 31–Feb. 3 Catfish Farmers of America, New Orleans, La.

February
- 3–5 National Navigation Conference of Water Resources Congress, New Orleans, La.
- 4–9 Society for Range Management, Boise, Idaho
- 5 American Geographical Society, New York, N.Y.
- 6–8 National Dairy Housing Conference, East Lansing, Mich.
- 11–15 National Association of Conservation Districts, Las Vegas, Nev.
- 18–21 Sprinkler Irrigation, Technical Conference, Dallas, Tex.
- 20–22 National Agricultural Outlook Conference, Washington, D.C.
- 21–23 Family Camping Federation, Nettles Island, Stuart, Fla.
- 24–28 American Association of School Administrators, Atlantic City, N.J.
- 25–28 National Association of Regional Councils, Minneapolis, Minn.
- 28–Mar. 2 Land Improvement Contractors of America, New Orleans, La.

March
- 3–6 Hardwood Plywood Manufacturers Association, Disneyworld, Orlando, Fla.
- 3–6 American Camping Association, Philadelphia, Pa.
- 9–15 Associated General Contractors of America, San Francisco, Calif.
- 11–14 Farmers Union, Omaha, Nebr.
- 11–16 American Society of Photogrammetry, Washington, D.C.
- 11–17 National Wildlife Week.
- 16–18 National Wildlife Federation, Washington, D.C.
- 17–28 American Association of School Administrators, San Francisco, Calif.
- 18–21 The Wildlife Society, Washington, D.C.
- 18–21 North American Wildlife and National Resource Conference, Washington, D.C.
- 18–21 Association for Supervision and Curriculum Development, Minneapolis, Minn.
- 28–30 No-tillage Conference, Soil Conservation Society of America, American Society of Agronomy, American Society of Agricultural Engineers, and National Association of Conservation Districts, Detroit, Mich.
- 30–Apr. 3 National Science Teachers Association, Detroit, Mich.

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Recon . . .

Will we perish in our own pollution? "The most advanced culture is the greatest sinner and the most backward when it comes to destroying our environment," say L. J. Murphy and C. V. Wright, civil engineers at the University of Missouri (Columbia). "We are destroying it at a ratio of ten to one as compared to the Asian peasant.

"Many immediate causes of pollution can be controlled in time. But, pollution has underlying human causes that are less amenable to change such as exploding population and a degree of carelessness exhibited by no other species."

Air pollution, down; water pollution, up. The President's Council on Environmental Quality has submitted its Third Annual Report to the President and Congress, predicting that expenditures of more than $287 billion will be needed between 1971 and 1980 to control pollution. Last year's CEQ report had set the figure at $105 billion for the period 1970-75. Most of the increase in the newest estimate is attributed to the post 1975 period and the addition of $9.6 billion in two new categories—water pollution from livestock feedlots and from construction sedimentation.

One of the more positive notes in the report was the news that air pollution conditions have improved. But water pollution from nutrients was said to be worsening.

Bear-ly a millionaire. Smokey has joined the millionaire's club. The nation's symbol of fire prevention has earned his millionth dollar from royalties collected over the past 10 years. In 1952 a law made it illegal to use Smokey's symbol without permission from the Forest Service. For any licensed commercial product sold, a royalty fee is collected and put into a special fund to help promote the cause of forest and range fire prevention. Similar legislation when passed by the Congress will help Woodsy Owl build a war chest for his nationwide fight against pollution.

Wind barriers. Three or four rows of flax spaced 15 to 30 feet apart have been used as wind barriers in summer fallow in one North Dakota county for 5 years. Through SCS efforts, the practice is gaining acceptance throughout the state.

It'll be green in spring. There are ways to protect turfgrass areas, such as golf greens, during winter. After conducting winter field trials and laboratory experiments, James B. Beard, a crop scientist at Michigan State University, reported that viscose-rayon fiber covers, viscose-rayon-polyester covers, and excelsior blankets protect the grass satisfactorily.

Crisis in the parks. Speaking to the National Recreation and Parks Association, James Watt, director of the Interior Department's Bureau of Outdoor Recreation, said that BOR is accelerating development of the Nationwide Outdoor Recreation Plan to help identify recreation requirements, facilities, and needs for the foreseeable future. "This plan alone will go far toward addressing the recreation crisis because it will tell us what the federal, state, and local governments, and the private sector, can do to meet the growing demands for recreation facilities."

Watt said that the $300-million-a-year Land and Water Conservation Fund, which BOR administers, has enabled more than 2 million acres of land to be acquired by federal, state, and local governments for public recreation.